

Centers of Research Excellence in Science and Technology FY2003 (CREST)

Program Solicitation

NSF 02-180

DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES
DIVISION OF HUMAN RESOURCE DEVELOPMENT

LETTER OF INTENT DUE DATE(S) (*strongly encouraged*): By 5 p.m. proposer's local time:
November 29, 2002

FULL PROPOSAL DEADLINE(S): By 5 p.m. proposer's local time: **January 14, 2003**



NATIONAL SCIENCE FOUNDATION



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SUMMARY OF PROGRAM REQUIREMENTS

GENERAL INFORMATION

Program Title: Centers of Research Excellence in Science and Technology FY2003 (CREST)

Synopsis of Program:

NSF recognizes that academic institutions with significant minority student enrollments play a vital role in conducting research that contributes to our knowledge base in all disciplines, and in educating minority students who go on to careers in fields of science, technology, engineering, and mathematics (STEM). The Centers of Research Excellence in Science and Technology (CREST) program makes substantial resources available to upgrade the capabilities of the most research-productive minority-serving institutions. It develops outstanding centers through the integration of education and research. It serves to promote the production of new knowledge, to increase the research productivity of individual faculty, and to expand a diverse student presence in STEM disciplines. The program also enables CREST Centers to increase the effectiveness of related science and engineering activities within their research areas.

CREST Program Components:

- The Research Infrastructure Improvement (RII) component supports the CREST program by providing substantial funding to eligible institutions able to demonstrate the existence of a strong research and education base and a compelling vision for research infrastructure improvement as well as an effective plan and the resources necessary to achieve and sustain national competitiveness in a sharply focused area of science or engineering research.
- Supplements to RII projects promote the CREST program by encouraging and facilitating establishment and/or enhancement of one or more collaborations with nationally recognized research centers of excellence in areas of mutual research interest and high priority for the CREST institution.
- CREST Co-funding supports proposals submitted to NSF's regular research programs by CREST-eligible institutions that substantially enhance research at one or more CREST RII awardee sites.

Cognizant Program Officer(s):

- Victor A. Santiago, Program Director, CREST, Directorate for Education and Human Resources, Division of Human Resource Development, National Science Foundation Room 815, telephone: (703) 292-4673, e-mail: vsantiag@nsf.gov.

Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):

- 47.076 --- Education and Human Resources

ELIGIBILITY INFORMATION

- **Organization Limit:**

Institutions eligible for a CREST RII award shall have:

- Enrollments of 50% or more members of minority groups that are underrepresented among those holding advanced degrees in science and engineering, e.g., Alaskan Natives (Eskimo or Aleut), American Indian, African American, Native Pacific Islanders (Polynesian or Micronesian), Hispanic or Latino;
 - Graduate programs in NSF-supported fields of science or engineering;
 - Demonstrated strengths in NSF-supported fields, as evidenced by an existing or developing capacity to offer doctoral degrees in one or more science and engineering disciplines;
 - A willingness and capacity to serve as a resource center in one or more research thrust areas; A demonstrated commitment and track record in enrolling and graduating minority scientists and engineers;
 - Strong collaborations in the proposed field of research.

- **PI Eligibility Limit:**

Principal Investigators for CREST-RII awards must be United States (U.S.) citizens or nationals, or permanent resident aliens of the U.S. and must be employed by CREST-eligible institutions.

- **Limit on Number of Proposals:**

- Only one CREST RII proposal may be submitted per institution;
- There is no limit on the number of proposals which may be certified as eligible for CREST co-funding;
- Priority will be given to those fields where minorities are significantly underrepresented;
- Institutions that have had two prior CREST awards may not participate in the program again until two years after the closing of the last award. At that time, new research teams from former awardee institutions may submit proposals in disciplinary areas that are completely different from those of the previous award(s).

AWARD INFORMATION

- **Anticipated Type of Award:** Cooperative Agreement (Centers); Standard Grant (Co-funding).
- **Estimated Number of Awards:** Up to 3 awards (RII). Up to 5 awards (Co-funding, Supplement). Subject to availability of funds.
- **Anticipated Funding Amount:** Up to \$1,000,000 per year for up to five years (RII). \$100,000 or 50% of total NSF support, whichever is less (per Co-funding award or per Supplement). Subject to availability of funds.

PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

- **Letters of Intent:** Submission of Letters of Intent is strongly encouraged. Please see the full program announcement/solicitation for further information.
- **Full Proposals:** Supplemental Preparation Guidelines
 - The program announcement/solicitation contains supplements to the standard Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full program announcement/solicitation for further information.

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required.
- **Indirect Cost (F&A) Limitations:** None.
- **Other Budgetary Limitations:** Other budgetary limitations apply. Please see the full program announcement/solicitation for further information.

C. Deadline/Target Dates

- **Letters of Intent (*strongly encouraged*):** By 5 p.m. proposer's local time: November 29, 2002
- **Preliminary Proposals (*optional*):** None
- **Full Proposal Deadline Date(s):** By 5 p.m. proposer's local time: January 14, 2003

D. FastLane Requirements

- **FastLane Submission:** Required
- **FastLane Contact(s):**
 - Gloria Strothers, Lead Program Assistant, Directorate for Education and Human Resources, Division of Human Resource Development, 815, telephone: 703-292-4718, e-mail: gstrothe@nsf.gov.
 - FastLane Help, telephone: 1-800-673-6188, e-mail: fastlane@nsf.gov.

PROPOSAL REVIEW INFORMATION

- **Merit Review Criteria:** National Science Board approved criteria. Additional merit review considerations apply. Please see the full program announcement/solicitation for further information.

AWARD ADMINISTRATION INFORMATION

- **Award Conditions:** Standard NSF award conditions apply.
- **Reporting Requirements:** Additional reporting requirements apply. Please see the full program announcement/solicitation for further information.

I. INTRODUCTION

The Division of Human Resource Development (HRD) has primary responsibility within NSF for broadening participation by all individuals in science and engineering. HRD programs reflect NSF's commitment to developing the resources of the scientific and technological community as a whole and ensuring an adequately trained research and development workforce in the next decade. To meet the challenges presented by the Nation's accelerating needs in science and technology, HRD, through programs such as CREST, is strengthening its efforts to increase the research productivity of faculty at minority-serving institutions as part of the broader objective of strengthening the research and education capabilities of minority-serving academic institutions.

II. PROGRAM DESCRIPTION

The CREST Program objectives are:

- o To enhance the research capabilities and education activities at the most productive minority serving institutions;
- o To produce new knowledge;
- o To enhance the national research competitiveness of individual faculty;
- o To promote organizational connections and linkages between CREST institutions and outstanding research and development organizations;
- o To foster integration of research and education at CREST institutions;
- o To increase participation in STEM disciplines by a diverse student population.

CREST Program Components:

- o The Research Infrastructure Improvement (RII) component supports the CREST program by providing substantial funding to eligible institutions able to demonstrate the existence of a strong research and education base and a compelling vision for research infrastructure improvement as well as an effective plan and the resources necessary to achieve and sustain national competitiveness in a sharply focused area of science or engineering research.
- o Supplements to RII projects promote the CREST program by encouraging and facilitating establishment and/or enhancement of one or more collaborations with nationally recognized research centers of excellence in areas of mutual research interest and high priority for the CREST institution.
- o CREST Co-funding supports proposals submitted to NSF's regular research programs by CREST-eligible institutions that substantially enhance research at one or more CREST RII awardee sites.

CREST supplements and CREST Co-funding both expand the intellectual and physical resources available to CREST RII awardee sites, CREST institutions and CREST faculty and students as well as broadening the base of support for achievement of CREST program objectives beyond the CREST community.

III. ELIGIBILITY INFORMATION

The policies of the CREST Program concerning eligible science and engineering disciplines are those of the National Science Foundation (NSF) and are detailed in the Grant Proposal Guide. CREST funding emphasis is in fields where support is not duplicated by major programs of other agencies. For example, proposals for biomedical or behavioral research in fields normally supported by the National Institutes of Health will not be accepted. Priority will be given to those research areas where minorities are significantly underrepresented. If an investigator is uncertain as to whether the proposed research is appropriate for the Foundation, he or she is encouraged to contact the CREST Program Director.

IV. AWARD INFORMATION

CREST award instruments are different for the three CREST program components:

- Up to 3 RII awards are anticipated in the current review cycle. CREST RII awards are for 60 months at up to \$1,000,000 annually (a maximum of \$5,000,000). RII awards are made as Cooperative Agreements. Progress and plans of each CREST RII site will be reviewed by NSF annually, prior to receiving continued NSF support. A CREST RII site nearing completion of its initial five years of funding may submit a competing renewal proposal for an additional five years of support, which will undergo merit review. The RII site's achievements and future plans will be evaluated comprehensively. The review will determine if the RII site is meeting its goals and objectives as originally proposed as well as the goals and objectives of the CREST Program. RII sites successful in passing this review will be renewed for another five years, commencing at the beginning of the sixth year, and will continue to be reviewed by NSF at least every 18 months. RII sites that do not pass this review may be terminated or may have their level of funding reduced. Individual CREST Centers may not receive more than 10 years of CREST support. Additional guidance for submitting a CREST RII renewal proposal is contained at the CREST program website.
- Up to 5 CREST Co-funding and Supplement awards will be made for a maximum of \$100,000 per Co-funding award or per Supplement, in amounts that vary with need and are subject to the availability of funds. CREST Co-funding awards shall be Standard or Continuing Grants and shall be for periods subject to the policies of the managing program. A Supplemental award will be an amendment to the existing Cooperative Agreement.
- The estimated CREST program budget, number of awards and average award size and duration are subject to the availability of funds.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent:

Letters of Intent are strongly encouraged for CREST RII proposals. The letter should contain sufficient details of each Subproject Proposal to permit identification of appropriate technical reviewers for that Subproject. Letters of Intent for CREST RII Proposals should be emailed to vsantiag@nsf.gov; Dr. Victor A. Santiago, Program Director, CREST, Division of Human Resource Development, National Science Foundation Room 815, 4201 Wilson Blvd., Arlington VA 22230.

Full Proposal:

Proposals submitted in response to this program announcement/solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF *Grant Proposal Guide* (GPG). The complete text of the GPG is available electronically on the NSF Web Site at: <http://www.nsf.gov/cgi-bin/getpub?gpg>. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from pubs@nsf.gov.

A(1). CREST RESEARCH INFRASTRUCTURE IMPROVEMENT (RII) AWARDS

CREST Research Infrastructure Improvement (RII) Awards are 60-month Cooperative Agreements of up to a total of \$5.0 million to support science and technology infrastructure improvements identified by the institution as being critical to its future research and development competitiveness. Principal investigators of CREST Research Infrastructure Improvement projects must be employed by the CREST-eligible institution.

All CREST-supported projects must have a unifying research focus in one of the research areas supported by NSF, provide convincing background and rationale for the proposed projects in terms of institutional mission, priorities, resources and opportunities, address the CREST program objectives described in this solicitation and meet national standards of excellence, including persuasive evidence of the ability to produce demonstrable achievements within the period covered by the award and the potential to obtain subsequent non-CREST support from federal, state, and/or private sector sources.

CREST experience indicates that infrastructure improvement strategies that sharply focus available fiscal and human resources on a limited number of research and development areas and activities that are consistent with long-term institutional objectives are most successful. CREST RII projects are built around up to five outstanding research thrust areas, which address a common theme, each of which demonstrates the potential of developing national competitiveness during the CREST award period. CREST support aims at building a broad, collaborative research and educational effort by: establishing links with national centers of research excellence and outstanding research scientists and engineers in academia, industry and national laboratories; encouraging multidisciplinary research and education; and integrating research and educational activities in ways that expand student career options and facilitate entry of underrepresented groups (i.e., minorities, women and persons with disabilities) into high demand science and technology fields. CREST RII funding may, for example, be used to support competitive levels of start-up funding for outstanding new faculty hires with research interests related to the Center theme and acquisition of key equipment and instruments including high performance computing and networking capabilities. CREST RII support should not replace other available federal, state, or institutional resources and should add significant value to the existing institutional strategic plan. Likewise CREST RII funding should not be employed as an alternative to support, which is available through NSF's regular grant programs and special competitions.

CREST projects are designed to facilitate self-improvement. Responsibility for project development and execution rests with the proposing institution and the CREST project director. Support may be requested for any activity that could have a direct positive influence on the competitiveness of participating scientists and engineers and the quality of the institution's research and training. Supportable activities may include, but are not limited to, exploratory research projects; acquisition of materials, supplies, research equipment and instrumentation; hiring nationally competitive scientists and/or engineers; use of visiting scientists and engineers as short- or long-term consultants; faculty attendance at professional meetings and seminars; faculty sabbaticals and exchange programs; undergraduate and graduate student research activities; development of outreach and other enhancement programs with neighboring institutions; and strengthening technical support personnel.

Plans may be organized around the development of individual scientists or engineers, one or more science or engineering department(s) (or equivalent units) or interdisciplinary and multidisciplinary research areas. It is expected, however, that the CREST target group(s) will possess the potential to achieve national competitiveness in research over the five-year implementation period. In identifying the members of this target group, NSF expects that the proposing institution will strongly encourage participation by minorities, women and persons with disabilities. Whether the proposed activity is considered competitive will be determined by merit review of the appropriateness and relevance of the improvement strategies to CREST program goals.

In addition to seeking funds to strengthen the CREST institution's own capabilities, funds may be requested to facilitate serving as a resource center for increasing the number and research competitiveness of minority scientists and engineers in the area of research focus of the CREST Center. Faculty at other institutions who participate in CREST Center-supported research and contribute to achievement of CREST project objectives are eligible for funding through the CREST Center with which they are affiliated.

Project activities supported by NSF may also include cooperative efforts between the applicant institution and industry, Federal laboratories or other research and development institutions and organizations both within the local region and nationally.

An institution's CREST request may include support for academic, state, for-profit, and non-profit organizations. It may also include individuals employed by such organizations both inside and outside the CREST institution. Cooperative programs among eligible institutions as well as cooperative programs between eligible institutions and other entities are eligible for CREST support. CREST-supported projects must contribute to and support the achievement of CREST objectives outlined in the synopsis for this solicitation. CREST funding must add substantial, measurable value to the existing science and technology research capability in areas of high institutional priority and demonstrate strong potential to generate sustained non-CREST funding from federal, state, or private sector sources. In addition, all activities carried out under a CREST award are subject to the restrictions concerning eligible science and engineering disciplines and activities detailed in the Grant Proposal Guide.

Each CREST Center shall convene, at least annually, an External Advisory Group. The advisors must include representatives from those served by the Center (e.g., academic institutions, industry, state and local agencies, national laboratories, etc.) and display the diversity of the U.S. citizenry in its membership. Those with a financial, institutional, or collaborative connection to the Center may not serve as members of the External Advisory Group. The function of the External Advisory Group is to provide guidance and advice to the Center as well as to ensure that the Center's activities are consistent with its vision, goals, and objectives. The membership of the CREST External Advisory Group must be included in the Special Information and Supplementary Documentation section of the CREST Center Proposal along with a brief statement of each member's qualifications and written confirmation of their commitment to serve.

A full CREST RII Proposal consists of multiple parts:

1. The Center Proposal which includes discussion of the applicant's entire plan for improving the status of science and engineering research and training and for increasing participation in science and engineering by a diverse student population. This overview should present a clear explanation of the proposed improvement plan from a scientific, administrative, and fiscal point of view. The Center Proposal must contain a Center Project Summary, which provides an overview of the Center Project and describes the synergy anticipated by the choice of subprojects. The Center Proposal is created and submitted using the NSF FastLane system.
2. Up to five, but not fewer than three Subproject Proposals each of which contains all the elements of a standard NSF research proposal but also contains a copy of the Center Project Summary described in the preceding paragraph. Each Subproject Proposal must be complete and will be independently evaluated following the standard NSF merit review process and criteria. In addition, each Subproject Proposal contains a one-page Subproject Relevancy Statement summarizing the subproject, describing the relevancy and importance of the subproject to the overall improvement plan, including synergy with the other subproject proposals, and showing how it supports the overall goals and objectives of the Center Proposal. The Subproject Proposals are inserted, successively, in the Special Information and Supplementary Documentation section of the Center Proposal.

Center Proposals should be prepared and submitted in accordance with specific guidelines provided in this document and the general guidelines provided in the current Grant Proposal Guide. Proposals that do not contain all the elements in the order given below are considered ineligible and will not be reviewed. The numbers in parentheses in the outline below are page limits for the corresponding element of the proposal. *Italics indicate the element is formatted by FastLane.* A full description of the contents of each proposal element follows the outline.

1. *Cover Sheet and Certification Page* (2)
2. Center Project Summary (1)
3. *Center Proposal Table of Contents* (1)
4. Center Project Description (10)
5. Center Proposal References (2)
6. Biographical Sketches for all senior personnel (maximum of two pages per sketch)
7. *Budgets* and Budget Justifications (five annual comprehensive budgets and one cumulative comprehensive budget, each with its own budget justification) (6+6).
8. *Current and Pending Support* for all senior personnel included in biographical sketches (allow 1 page per person)
9. *Center Facilities and Equipment* (comprehensive, includes all subproject facilities and equipment) (1)

10. Special Information and Supplementary Documentation - Insert letters of commitment, External Advisory Committee information, etc. in this section.

The Subproject Proposals are inserted successively, as separate files, in the Special Information and Supplementary Documentation section following the Center Proposal supplementary documents.

Cover Sheet and Institutional Certifications for Center Proposal: This form is automatically generated by FastLane. Center Proposal titles should begin with the word CREST. The CREST Program Solicitation number, NSF 02-180, must be entered in the appropriate box on the cover sheet. Select CENTERS OF RSCH EXCELL IN S&T as the appropriate NSF program and Division of Human Resource Development (HRD) as the NSF division to be entered on the proposal cover sheet.

A Center Proposal may have one PI and up to four Co-PIs. Additional senior personnel can be included in the Center Budget (NSF Form 1030HRD) and in the Project and Subproject Descriptions. All Senior Personnel must provide biographical sketches and list current and pending support.

Project Summary for the Center Proposal: Provide a brief (one page or less) description of the Center (i.e., overall) project, clearly stating project objectives and strategies, rationale, vision, distinguishing features, multidisciplinary or disciplinary focus, proposed research and educational activities, integrative components (e.g., synergy between subprojects), and diversity plan. Include the title of the Center, the name of the Center Project Director (PI), and lead institution at the top of the page. The Center Project Summary is completed in FastLane and copied into each Subproject Description.

Table of Contents for CREST Center Proposal: This form is automatically generated by FastLane.

Project Description for Center Proposal: The Center project narrative (not to exceed 10 single-spaced typed pages in standard font size of 10 to 12 points) presents much of the information that determines whether an award will be made. All pages must be numbered at the bottom with 2.5 cm. margins at the top, bottom, and on each side. The project description must develop a research focus that is sufficiently comprehensive to justify a Center form of organization and flexible enough to permit modifications as appropriate over the course of the project should an award be made. It should describe the Center's goals and proposed research activities in sufficient detail to allow assessment of the ways in which they work together to address: the Center's theme; the necessity for the Center mode of operation; and the CREST program objective of achieving national research competitiveness in the proposed areas of research focus during the period of the award. The Center Project Description should indicate the impact the Center's research will have on the nation's scientific and technological base.

In preparing Center and Subproject Proposals, careful attention should be given to the evaluation criteria listed in the section of this solicitation describing the NSF proposal review process. In discussing the science and engineering activities, sufficient content should be provided in the Center Proposal to allow an assessment of the relevance and appropriateness of each proposed subproject to the overall Center project goals and the synergy created by the choice of subproject research areas. However, detailed technical descriptions should be reserved for the Subproject Proposals.

References. The purpose of the references in the Center Proposal is to demonstrate that project planning has included review of relevant documents describing the current institutional situation as well as pertinent available literature and that such information has been used effectively in developing the proposed research infrastructure improvement plan for the Center. Citations must include the full title and names of all authors for each reference.

Biographical Sketches: Biographical sketches of all senior personnel involved in the operation of the Center must be provided in the Center Proposal using the FastLane system and following the guidelines in the current Grant Proposal Guide. All information that is deemed pertinent is allowable provided that the two-page limit is not exceeded. Do not send copies of publications.

Current and Pending Support: This section is generated by FastLane. Provide a complete listing of current and pending support for the Principal Investigator, Co-Principal Investigator(s), and non Co-PI Senior Personnel only. If their biographical sketch was included, then you must include a statement about their current and pending support following the guidelines in the current Grant Proposal Guide.

Budgets/Budget Justifications: Use of form 1030HRD is required. The comprehensive CREST Center (i.e., overall) budget is developed through FastLane and includes five annual and one cumulative budget with the corresponding budget justifications for each.

Facilities and Equipment: This section is developed using FastLane and is comprehensive for the Center including facilities and equipment to be made available to each subproject. In addition, each CREST Subproject Proposal includes information on important facilities and equipment to which it will have access.

Special Information and Supplementary Documentation: Letters of commitment are required from the applicant institution and its partners, signed by an official authorized to commit support to the CREST project during its life span. Letters committing industrial and/or other partners to involvement and financial or other support are required. In addition this section contains the membership list of the External Advisory Group (EAG), a brief statement of each proposed EAG member's qualifications and letters committing the proposed EAG members to serve. Commitment letters are not included in the page count. These letters must be inserted into the Special Information and Supplementary Documentation section of the proposal and submitted electronically. Hard copies must not be mailed to NSF.

Subproject Proposals

The primary information source for developing Subproject Proposals is the current Grant Proposal Guide. Each CREST RII project must maintain at least three but no more than five research subprojects. Each subproject must submit a complete Subproject Proposal as outlined below and described in detail at the HRD website. The numbers in parenthesis are the page limits for each Subproject Proposal Element.

Subproject I

- Ia. CREST Subproject Proposal Title Page and Table of Contents (1)
- Ib. CREST Center Project Summary (this is a copy of element 2 of the full Center proposal as described above) (1).
- Ic. Subproject relevancy statement (1).
- Id. Subproject Description (8 pages; up to 4 additional pages may be used to discuss relevant prior results).
- Ie. Subproject References (2).
- If. Each Subproject Proposal has five annual and one cumulative budget and a budget justification for each year (6 + 6).
- Ig. CREST Subproject Facilities and Equipment (1).

Repeat sections a-g as above for subprojects II, III, etc.

Consult the NSF FastLane homepage and the institutional sponsored projects officer for directions on providing access by appropriate Center senior personnel to the Center Proposal being developed in FastLane.

A(2). CREST CENTER SUPPLEMENTAL AWARDS

The CREST Program will consider requests for supplements to existing CREST Research Infrastructure Improvement (RII) Cooperative Agreements for the purpose of fostering partnerships, which provide additional expertise and assistance to the grantee in furthering project objectives as well as the objectives of the CREST program. Typically these supplements will be requested to establish or enhance collaborations with NSF-funded centers (e.g., Materials Research Science and Engineering Centers) and other federal, industrial and academic research and development laboratories with nationally recognized capabilities. In this context a partner is an institution or organization that invests intellectual resources in the partnership backed by financial commitments to ensure the partners' vital participation in a joint effort incorporating research, education and knowledge transfer. Also eligible for

Supplemental support are partnerships between CREST institutions and the private commercial sector, especially those that increase linkages between CREST institutions and their counterparts in high-technology small business thereby increasing competitiveness of the partners' science and technology entrepreneurial talent for Federal Small Business Innovation Research grant funding. Supplement requests must describe the specific need to be addressed; detail how the institution proposes to meet the need; and provide an explicit budget and budget justification. CREST supplements will be considered for amounts that vary according to the specific need to be addressed for amounts up to \$100,000 per supplement and are subject to availability of funds. Proposals for CREST Supplements follow the standard guidelines of the current Grant Proposal Guide and are subject to a limit of eight pages of project description and up to four additional pages for results from prior work.

Supplemental funding of the sort described above has proven to be an important factor in improving the quality of the research in thrust areas where it has occurred and in achieving two key goals of the CREST program: (1) to enable faculty at CREST institutions to cooperate with other science and engineering centers of excellence to increase the effectiveness of CREST related science and engineering activities and (2) to build bridges for minority student career development through alliances with business, government laboratories and other universities. CREST supplements expand the intellectual and physical resources available to CREST RII awardee sites, CREST institutions and CREST faculty and students as well as broaden the base of support for achievement of CREST program objectives beyond the CREST community.

A(3). CREST CO-FUNDING

Through the Co-funding initiative, joint support may be provided for certain CREST-certified and meritorious proposals submitted to the Foundation's other (i.e. non-CREST) ongoing research and educational programs and special competitions. The Co-funding Initiative is an NSF cross directorate activity, applicable to programs in all Directorates and the Office of Polar Programs.

The review and administration of a CREST-certified Co-funding proposal will be handled by the NSF program to which it is submitted. CREST Co-funding eligibility is kept in confidence by the managing program to which a proposal has been submitted and is not a factor in the review of certified proposals.

Further information on the CREST program and the Supplemental and Co-funding Initiatives can be found at the CREST program website: <http://www.ehr.nsf.gov/EHR/HRD/Crest.asp>.

Proposers are reminded to identify the program solicitation number (NSF-02-180) in the program announcement/solicitation block on the proposal Cover Sheet. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Budgetary Information

Indirect Cost (F&A) Limitations: None.

Other Budgetary Limitations: Use of NSF budget Form 1030HRD (9/94) is required. Budgets for each year of requested support, a cumulative budget and budget justifications are required for each research subproject and subcontract as well as for the Center as a whole.

NOTE: Equipment costs may not exceed 30% of the total budget request.

C. Deadline/Target Dates

Proposals must be submitted by the following date(s):

LETTER OF INTENT DUE DATE(S) (*strongly encouraged*): By 5 p.m. proposer's local time: November 29, 2002

FULL PROPOSAL DEADLINE(S): By 5 p.m. proposer's local time: January 14, 2003

D.FastLane Requirements

Proposers are required to prepare and submit all proposals for this Program Solicitation through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: <http://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this Program Solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this announcement/solicitation.

Submission of Electronically Signed Cover Sheets. The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see [Chapter II, Section C](#) of the Grant Proposal Guide for a listing of the certifications). The AOR must provide the required electronic certifications within five working days following the electronic submission of the proposal. Proposers are no longer required to provide a paper copy of the signed Proposal Cover Sheet to NSF. Further instructions regarding this process are available on the FastLane website at: <http://www.fastlane.nsf.gov>.

VI. PROPOSAL REVIEW INFORMATION

A. NSF Proposal Review Process

Reviews of proposals submitted to NSF are solicited from peers with expertise in the substantive area of the proposed research or education project. These reviewers are selected by Program Officers charged with the oversight of the review process. NSF invites the proposer to suggest, at the time of submission, the names of appropriate or inappropriate reviewers. Care is taken to ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from non-academic institutions, minority-serving institutions, or adjacent disciplines to that principally addressed in the proposal.

The National Science Board approved revised criteria for evaluating proposals at its meeting on March 28, 1997 (NSB 97-72). All NSF proposals are evaluated through use of the two merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

On July 8, 2002, the NSF Director issued Important Notice 127, *Implementation of new Grant Proposal Guide Requirements Related to the Broader Impacts Criterion*. This Important Notice reinforces the importance of addressing both criteria in the preparation and review of all proposals submitted to NSF. NSF continues to strengthen its internal processes to ensure that both of the merit review criteria are addressed when making funding decisions.

In an effort to increase compliance with these requirements, the January 2002 issuance of the GPG incorporated revised proposal preparation guidelines relating to the development of the Project Summary and Project Description. Chapter II of the GPG specifies that Principal Investigators (PIs) must address both merit review criteria in separate statements within the one-page Project Summary. This chapter also reiterates that broader impacts resulting from the proposed project must be addressed in the Project Description and described as an integral part of the narrative.

Effective October 1, 2002, NSF will return without review proposals that do not separately address both merit review criteria within the Project Summary. It is believed that these changes to NSF proposal preparation and processing guidelines will more clearly articulate the importance of broader impacts to NSF-funded projects.

The two National Science Board approved merit review criteria are listed below (see the [Grant Proposal Guide](#) Chapter III.A for further information). The criteria include considerations that help define them. These considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which he/she is qualified to make judgments.

What is the intellectual merit of the proposed activity?

How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

What are the broader impacts of the proposed activity?

How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

NSF staff will give careful consideration to the following in making funding decisions:

Integration of Research and Education

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

Integrating Diversity into NSF Programs, Projects, and Activities

Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

Additional Review Criteria

The review of CREST RII proposals (consisting of both Center and Subproject components) will be carried out in three stages:

- Disciplinary mail review of Subproject Proposals by nationally recognized research scientists and engineers;
- Review of the Center proposal by an interdisciplinary panel of recognized academic and scientific experts, in light of the mail reviews and their own reading of the Subproject Proposals;
- Site visits to selected applicant institutions by experts knowledgeable about development programs, including NSF program officers.

The Center proposal will be reviewed for:

- Appropriateness of the center-mode of organization. Are the research, educational, and knowledge transfer activities strategically integrated such that the whole is greater than the sum of the parts? Are the partners vital participants in an integrated whole?
- The Adequacy of the Management Plan. The Center Proposal will be evaluated for the institution's plan to manage the CREST project including its plans to seek input and collaboration with internal and external individuals and groups supportive of project objectives and its plans to monitor and evaluate achievement of project goals. Do the CREST Project Director and the Center leadership team convincingly demonstrate the vision, experience, and capacity to manage a complex, multi-faceted, and innovative research, education, and knowledge transfer enterprise? What is the likely effectiveness of the proposed management plan including the mechanisms for: selection of the Center research theme and subprojects; resource allocation; evaluation of project and especially subproject progress; and project maintenance on award expiration? Is there documentation of institutional and other commitments to the proposed Center? Is the requested budget appropriate?
- Commitment and Dedication of the Institution to CREST Program and Project Goals. Institutional commitment to strengthening research and research training capabilities will be a critical factor in proposal evaluation. This may be demonstrated by evidence of long-term institutionally-based initiatives to enhance its science or engineering programs and by plans for continued growth and maintenance of the Center beyond the term of the NSF award.
- Scientific and Engineering Excellence of the Improvement Plan and its Potential for Success. The overall CREST RII Proposal (consisting of both Center and Subproject components) will be evaluated for its potential to make significant improvements in, and the likelihood of contributing to, the national scientific and engineering knowledge base.

- Potential for Enhancing Underrepresented Groups' Participation in Science and Engineering. The CREST RII Proposal will be evaluated for: its potential to broaden opportunities for, and enable participation by, all citizens in the science and engineering enterprise; the relevance and appropriateness of the strategies employed to enhance the movement of individuals from underrepresented groups into science and engineering careers; evidence of substantial involvement of faculty and students from such groups. High university-wide minority enrollment is not sufficient in and of itself to justify a CREST award. Priority will be given to applications which focus on those NSF supported disciplinary areas where significant under-representation exists.
- Adequacy and Potential of Existing Scientific and Engineering Base. CREST RII Proposals will be evaluated for their potential to strengthen existing meritorious research activities. Meritorious research projects, for the CREST RII competition, will be those that have led to publications in refereed journals and increased student participation in science and engineering and where there is an existing or developing capacity to offer doctoral degrees in a relevant discipline. The CREST RII Proposal should describe the relation of the planned activities to other grant-supported operations and must demonstrate: (a) that the existing institutional research base is sufficiently strong to permit substantial advances in quality with the CREST funds, and (b) that a CREST award will result in a substantial long-term enhancement of that base level.
- The Extent of Outreach and Impact of the Proposed RII awardee site. The CREST RII Proposal will be evaluated for promise in making a contribution to the overall strengthening of the nation's science and engineering productivity and for enhancing participation in science and engineering over the long term by a diverse student population.
- Uniqueness of the Project. The CREST RII Proposal will be evaluated for the unique institutional capabilities, which make it especially qualified to become a productive Center of Research Excellence.

B. Review Protocol and Associated Customer Service Standard

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in response to this announcement/solicitation will be reviewed by Mail Review followed by Panel Review.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

A summary rating and accompanying narrative will be completed and submitted by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the identities of reviewers, are sent to the Principal Investigator/Project Director by the Program Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on the closing date of an announcement/solicitation or the date of proposal receipt (whichever is later). The interval ends when the Division Director accepts the Program Officer's recommendation.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program Division administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See section VI.A. for additional information on the review process.)

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (NSF-GC-1)* or Federal Demonstration Partnership (FDP) Terms and Conditions;* and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreement awards also are administered in accordance with NSF Cooperative Agreement Terms and Conditions (CA-1). Electronic mail notification is the preferred way to transmit NSF awards to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

*These documents may be accessed electronically on NSF's Web site at http://www.nsf.gov/home/grants/grants_gac.htm. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from pubs@nsf.gov.

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Web site at <http://www.nsf.gov/cgi-bin/getpub?gpm>. The GPM is also for sale through the Superintendent of Documents, Government Printing Office (GPO), Washington, DC 20402. The telephone number at GPO for subscription information is (202) 512-1800. The GPM may be ordered through the GPO Web site at <http://www.gpo.gov>.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the PI must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period.

Special award conditions anticipated:

Cooperative Agreements have an extensive section of Special Conditions relating to the period of performance, statement of work and awardee responsibilities, NSF responsibilities, joint NSF-awardee responsibilities, funding and funding schedule, reporting requirements, lead personnel, and other conditions. Awardees should review and be familiar with those conditions.

Special reporting requirements anticipated:

CREST RII awardees will be required to submit annual reports on progress and plans for the following year, which will be used as a basis for performance review and determining the level of continued funding. To support this review and the management of a Center, awardees will be required to develop a set of management and performance indicators for submission annually to NSF via an NSF evaluation technical assistance contractor. Part of this reporting will take the form of a database, which will be owned by the institution and eventually made available to an evaluation contractor. This database will capture specific information to demonstrate progress towards achieving the goals of the project. These indicators are both quantitative and descriptive and may include, for example, the characteristics of center personnel and students; sources of financial support and in-kind support; expenditures by operational component; characteristics of industrial and/or other sector participation; research activities; education activities; knowledge transfer activities; patents, licenses; publications; degrees granted to students involved in RII awardee activities; descriptions of significant advances and other outcomes of the CREST effort. Such reporting requirements will be included in the cooperative agreement, which is binding between the academic institution and the NSF. Additional information and guidance for reporting CREST RII awardee progress are available at: <http://www.ehr.nsf.gov/ehr/hrd/CRESTAnnRepGuide.doc>

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project reporting system, available through FastLane, for preparation and submission of annual and final project reports. This system permits electronic submission and updating of project reports, including information on project participants (individual and organizational), activities and findings, publications, and other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system.

VIII. CONTACTS FOR ADDITIONAL INFORMATION

General inquiries regarding Centers of Research Excellence in Science and Technology FY2003 should be made to:

- Victor A. Santiago, Program Director, CREST, Directorate for Education and Human Resources, Division of Human Resource Development, National Science Foundation Room 815, telephone: (703) 292-4673, e-mail: vsantiag@nsf.gov.

For questions related to the use of FastLane, contact:

- Gloria Strothers, Lead Program Assistant, Directorate for Education and Human Resources, Division of Human Resource Development, 815, telephone: 703-292-4718, e-mail: gstrothe@nsf.gov.
- FastLane Help, telephone: 1-800-673-6188, e-mail: fastlane@nsf.gov.

IX. OTHER PROGRAMS OF INTEREST

The NSF *Guide to Programs* is a compilation of funding for research and education in science, mathematics, and engineering. The NSF *Guide to Programs* is available electronically at <http://www.nsf.gov/cgi-bin/getpub?gp>. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter.

Many NSF programs offer announcements or solicitations concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices. Any changes in NSF's fiscal year programs occurring after press time for the *Guide to Programs* will be announced in the NSF [E-Bulletin](#), which is updated daily on the NSF web site at <http://www.nsf.gov/home/ebulletin>, and in individual program announcements/solicitations. Subscribers can also sign up for NSF's [Custom News Service](#) (<http://www.nsf.gov/home/cns/start.htm>) to be notified of new funding opportunities that become available.

The Louis Stokes Alliances for Minority Participation Program is among those that target underrepresented minorities in science, engineering, mathematics, and technology and that promote innovation in education for all students. Other related programs include the following: Alliances for Graduate Education and the Professoriate (AGEP), Historically Black Colleges and Universities - Undergraduate Program (HBCU-UP); Tribal Colleges and Universities Program; and Integrated Graduate Education Research and Training (IGERT).

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Awardees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, the Foundation does not assume responsibility for such findings or their interpretation.

NSF welcomes proposals from all qualified scientists, engineers and educators. The Foundation strongly encourages women, minorities and persons with disabilities to compete fully in its programs. In accordance with Federal statutes, regulations and NSF policies, no person on grounds of race, color, age, sex, national origin or disability shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NSF, although some programs may have special requirements that limit eligibility.

Facilitation Awards for Scientists and Engineers with Disabilities (FASSED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF-supported projects. See the GPG Chapter 11, Section D.2 for instructions regarding preparation of these types of proposals.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090, FIRS at 1-800-877-8339.

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to applicant institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies needing information as part of the review process or in order to coordinate programs; and to another Federal agency, court or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid OMB control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Suzanne Plimpton, Reports Clearance Officer, Division of Administrative Services, National Science Foundation, Arlington, VA 22230.

OMB control number: 3145-0058.